ing the standard of American botanical science as a whole. The means relied upon for accomplishing this object were (1) to create a greater feeling of fraternity among botanists and thus induce more of them to attend the meetings, (2) to make the sessions quite informal, so that every one in attendance would feel unembarrassed and at liberty to offer any bit of information that he might think of interest to his fellow workers, (3) to provide an audience for hearing such papers as are worthy of record, but because of their brevity or the relative unimportance of their conclusions would add nothing to the dignity or value of the proceedings of the biological section of the association, (4) to scrupulously refrain from permitting the club in any way to occupy or trespass upon the time or the interests rightfully belonging to the association, and (5) to keep the club intimately but unofficially connected with the association and allow no independent organization. The lines on which the club was established have been very well maintained, and the opinion of members of the association, whether botanists or not, goes to show that it has exerted a considerable influence and been reasonably successful in its aims. It is in this very element of success, in fact, that the danger to the club lies. It seems to be the common opinion outside of the club, and, we regret to say, is held by some botanists as well, that the club, having become so strong, will eventually form a section of the association. It seems to us that those holding such views do not rightly appreciate what the club is attempting to do. The idea of transforming such an excellent lever for accomplishing a good purpose into the thing to be elevated, ought to require no argument to show its want of wisdom. This journal gave some suggestions relative to the sphere of the club, in its editorial on the same subject a year ago, which it is not necessary to repeat here, although they might profitably be borne in mind by those who help in shaping the botanical features of the programme for the meetings of both the club and the association.

NOTES AND NEWS.

THE AMERICAN ASSOCIATION meets next year at Indianapolis on the third Wednesday in August.

PROF. DR. SADEBECK has been entrusted with the administration of the Botanical Gardens at Hamburg, vice Prof. Reichenbach, deceased.

PROF. DR. K. PRANTL, of Aschaffenburg, has been nominated as the successor of Prof. Dr. Engler as Professor of Botany and Director of the Botanical Gardens of the University of Bresleau.

PROF. A. J. COOK, concludes from observation and experiment that honey is digested nectar, that when bees gather nectar very rapidly, however, some of it fails to be digested. Honey taken under such circumstances will show right hand rotation from the presence of unchanged sucrose.

MISS SUSAN M. HALLOWELL, of Wellesley College, notes and illustrates in the *American Florist* for October 1, an interesting variation in a calla (Richardia) in which a pure white but otherwise normal leaf arises from the pedicel just below and opposite the true spathe, giving the appearance of a double spathe.

THE COMMON cultivated grasses do not grow well upon the virgin soil of Nebraska, according to Prof. Bessey, but timothy (Phleum pratense) succeeds after a few years of preliminary tillage, and is the grass mostly grown, while Kentucky blue-grass also does well if a still longer interval of previous cultivation is allowed.

IN THE CELL produced directly by the zoospores of Synchytrium Taraxici the nucleus has been found of a diameter of 14μ, and the nucleolus 8μ. Shortly after this size has been attained division commences, resulting in the production of from 150 to 300 nuclei in the one cell. So says M. Dangeard, *Comptes Rendus*, cix, 1889, 202.

PROFESSOR GEORGE L. GOODALE, of Harvard University, is president of the A. A. A. S. for 1890. This is the second time in the history of the society that a botanist has filled the president's chair. Dr. Gray was the first recipient of the honor, in 1871. The vice-president of the biological section for 1890 is Dr. C. S. Minot, and the secretary, Dr. J. M. Coulter.

THE TOTAL NUMBER of papers presented at the Toronto meeting of the A. A. A. S. was 228, of which 34 came before the biological section. Twenty-two of the papers in biology were botanical, or 65 per cent., and the remaining 12 were mainly entomological. Zoölogy proper made a comparatively small showing. One might inquire if this mathematical relationship is not correlated in some manner with the establishment of biological clubs.

THE OFFICERS for the coming year of the Society for the Promotion of Agricultural Science are Prof. C. E. Bessey, of University of Nebraska, for president; Prof. W. R. Lazenby, of Ohio University, for secretary and treasurer; and Prof. T. J. Burrill, of Illinois University, for third member of the council. Thus all the officers of the society have inadvertently been filled with botanists. It is also a notable fact that one-fourth the members of the society are also botanists.

M. A. GIARD notes in the *Comptes Rendus* (cix, 1889, 324) an instance of the sterility (castration parasitaire) in Hypericum perforatum, due to the attacks of *Cecidomya hyperici* Bremi and *Erysiphe Martii* Lév. The most interesting feature of this parasitism, however, is that the insect and the fungus both produce profound changes in the general aspect of the plant, but the induced *facies* are absolutely unlike. The normal form of this species is that of an inverted cone, the lower branches being elongated and forming with the main axis a large compound corymb of flowers. Under the action of the Erysiphe, all the branches are abortive or rudimentary; the principal stem bears a few flowers, which mostly are sterile, but the leaves are very much larger than in the normal state and of a deeper green. Under the influence of the Cecidomya the form becomes that of an erect cone, the leaves become narrow, almost linear, colored externally like fruits, the parenchyma thickens, and at the edges are formed numerous black glandular points identical with those on the margins of the petals. The form thus produced resembles strongly the variety described by Jordan under the name H. microphyllum.

SAPOSCHNIKOFF finds[4] that sugar can be transformed by the leaves into starch. In his experiments he placed plants of various sorts in the dark for a time, then cut off some leaves and bisected each along the midrib. One-half was tested for starch, the other was laid for 4–18 days in a 10–20 per cent. solution of cane sugar, and then tested for starch both with iodine and by Faulenbach's method. Starch was found in abundance, especially along the veins. When the lower end of a leaf of Cordyline rubra was dipped 5 mm. in the sugar the leaf was black under the iodine test as far as 7 mm., from which point up to 10 mm. the color gradually became less deep, but extended far along the veins. In variegated leaves only the chlorophyllous cells formed starch.

THOSE who have used the paraffin imbedding method for serial sections (see this journal for January, 1888) have doubtless wished for some simplification of the process of staining. This may be done, according to Dr. Kükenthal, by dissolving the coloring matter in absolute alcohol and dropping the solution into turpentine until the desired depth of color is secured. Sections fixed to the slide with the collodion are kept in the oven until the clove oil has completely evaporated, the paraffin dissolved in turpentine as usual, and the slide brought into the dye. The staining is quickly effected. Overstaining may be corrected by placing the slide for a short time in a mixture of acid-free absolute alcohol and turpentine (equal parts?). Turbidity of the coloring fluid may be corrected by adding a drop or two of alcohol. Meyer's carmine, methyl green, methyl-blue, gentian-violet, safranin, Bismarck-brown, eosin, fuchsin, tropæolin and malachite-green may be used in the above way.

THE SOCIETY for the Promotion of Agricultural Science held its tenth annual meeting at Toronto, August 27 and 28. Twenty-five papers were presented, of which the following are of botanical interest: J. C. Arthur, "What is common wheat rust?" the conclusion being reached that the most abundant and damaging rust of this country is not Puccinia graminis, as usually assumed, but P. rubigo-vera; W. J. Beal, "A study of bird's-eye maple," specimens of wood from maple and other trees being shown to illustrate various appearances and peculiarities of this malformation, but no conclusion regarding the cause arrived at, also "Wild grasses under cultivation," giving the result of raising the glaucous form of Elymus Virginicus from seed, only two plants out of four hundred reverting to the non-glaucous form; C. E. Bessey, "The grass problem in Nebraska," giving an account of the distribution and economic value of the most prominent native grasses, and the success attained in introducing the cultivated ones; T. J. Burrill, "A bacterial disease of Indian corn," describing an important disease chiefly affecting the roots and lower internodes; F. L. Scribner, "Grasses of mountain meadows and deer parks," among which species of Danthonia were considered the most important economically. Several other papers contained more or less botanical matter, among which were the following: Manly Miles illustrated a paper on soil metabolism by showing test-tubes said to have been etched by soil bacteria grown in nutrient material without potash; M. A. Scovell gave an account of experiments with potatoes in which blighting of the foliage was prevented by use of potash salts upon soil previously deficient in potash, the kind of blight not determined; William Saunders spoke of the comparative yield of varieties of wheat, considering each plant in the experiment individually; C. M. Weed described the treatment of potatoes with Bordeaux mixture, successfully checking the blight

[4]Berichte. d. D. bot. Gesells., vii. 258.

(Phytophthora) with four applications of half strength solution; H. W. Wiley gave analyses of sorghum seed and spoke of its comparative food value, and also of the nature of the red coloring matter of the seed and glumes. Two papers by B. D. Halsted, "The cranberry gall fungus" and "Our worst weeds," were read by title only.

IT HAS PROVED a difficult task to settle experimentally the place of the transpiration stream in plants, particularly in the herbaceous dicots and the monocots. Long ago the experiment of "ringing" the trunk of the woody plants determined that it was either in the wood body or pith that the water was conducted, and reasoning showed pretty conclusively that the pith could not have anything to do with this work. But recently Hartig and Wieler have differed widely as to what parts of the wood were most active in conduction. A long step forward in the experimental work on this function has been made by Bokorny[1] in hitting upon the use of iron sulphate. For a long time various liquids have been used in the endeavor to ascertain the rate of the transpiration stream; at first coloring matters in solution, and later salts of lithium. The difficulty with the latter is that while they can be easily detected spectroscopically in any region of the plant, it is not practicable to detect them in a tissue nor to discern whether they are in the walls or the lumen. Iron sulphate possesses the three necessary qualities of not being seized upon by any particular part of the plant, of not injuring the cells and of being easily recognized *in loco* by a simple microchemical reaction. It is used in the proportion of 1:500 or 1:1000 of distilled water, and its presence in any tissue can be detected by the use of a watery solution of ferricyanide of potassium (1:10). In general, Bokorny's results agree with the statements of Sachs (Cf. Vorlesungen über Pfl.-Phys.) except in the important particular that often tissues that are not lignified (e. g., epidermis, collenchyma, soft bast) are water-conducting, so that Sachs' insistence upon the lignification of the walls as the reason of their permeability falls to the ground. Whether in woody plants or herbs, it is the vascular bundle chiefly in which the water travels, though in some collenchyma and sclerenchyma are also conducting. In the vascular bundles it is chiefly the xylem which carries the water, sometimes the thin-walled bast. In all cases the water goes in the wall, and not in the lumen of the cell.

LEO LESQUEREUX, our most eminent bryologist and palæo-botanist, died at his home in Columbus, Ohio, on Friday, October 25th, aged almost eighty-nine years. Some years ago failing sight compelled him to give up his bryological studies, and his strength has been gradually failing. We hope to give a further account of his life and works in our next number.

---

[1]Biologisches Centralblatt, ix, 1889, p. 289; Ueber den Ort der Wasserleitung in den Pflanzen.